

diagnostic enlarged second gnathopods are present only in the males which are much less commonly encountered than females. The inexperienced observer presented with female *M. cumbrensis* is easily misled by the acute eye lobe which suggests it may be a juvenile *Gammaropsis cornuta*. However careful examination of the carpus of the gnathopods shows these to be oval with smooth palms and lacking the distinct profile of *G. cornuta* or the other british *Gammaropsis* species. The discovery of new material of *M. cumbrensis* at a new site in the Forth Sea Area suggests that is probably fairly widely distributed and in many cases may be overlooked or misidentified.

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THE JAPANESE MACHO SKELETON SHRIMP (*CAPRELLA MUTICA*) IN THE CLYDE ESTUARY

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Skeleton Shrimps are amphipod crustaceans belonging to the families Caprellidae and Phtisicidae. There are thirteen species native to British waters. The Japanese "Macho" Skeleton Shrimp is a recent arrival in Europe. It was first discovered in Dutch waters by Platvoet *et al.* in 1995. Although regarded as probably an accidental alien import, its true identity was not realised at the time and they described it as a new species "*Caprella macho*", alluding to the hairy appearance of the large robust males.

The same shrimp first came to light in UK waters in July 2000 when specimens from a fish farm near Oban were sent to the Dunstaffnage Marine Laboratory for identification. Its true identity was then recognised as *Caprella mutica*, a species originally described from the Sea of Japan in 1935. Scientists began an investigation to determine its distribution in Scotland (Willis *et al.* 2003, 2004). *C. mutica* appeared to like hanging around on mooring ropes at fish farms, so to help locate new records a web page was set up within the Scottish Association of Marine Science website (www.sams.ac.uk) to alert those in the fish farm industry as well as the sailing fraternity.

It soon became apparent that *C. mutica* was already widespread on the west coast of Scotland in Loch Linnhe, Loch Creran, Loch Sunart, the Sound of Mull and the Western Isles (Cook *et al.*, 2003). It has also turned up in other parts of the UK as well as in Ireland, Germany and Norway (Tierney *et al.* 2004, Buschbaum & Gutow, 2005, Ashton *et al.*, 2006). It was not long before the shrimp "invasion" hit the press headlines (Scotland on Sunday, Sunday Times, Oban Times).

Prompted by this publicity, caprellid shrimps held in the SEPA marine lab reference collection at East Kilbride were re-examined in 2003 and some specimens, initially identified as *C. tuberculata*, turned out to be *C. mutica*. These had been collected in August 1999 at a buoy moored by SEPA at the Roseneath Patch, 1.3km north of Whiteforeland Point, Gourrock. Although hundreds of shrimps had been observed on the mooring rope, only 6 had been retained - 4 adult males (about 2cm long), and 2 adult females (about 1cm long). This re-discovery indicated that *C. mutica* had already arrived in the Clyde Estuary before it came to light further north near Oban. Further sampling in September and October 2004 at another SEPA buoy moored at Dunoon Bank (1km east of Dunoon Pier) also revealed the presence of hundreds of *C. mutica*. Numerous specimens were collected and forwarded to the Dunstaffnage Lab to assist with genetic studies. In April 2006 material of the alien ascidian, *Styela clava*, collected from Ardrrossan marina also had some *C. mutica* attached indicating the species is now well established throughout the Clyde Sea area.

It is not surprising that the occurrence of *C. mutica* has been overlooked until recently. The only comprehensive identification key for caprellids in UK waters, Harrison (1944), has not been updated since the last world war. In Harrison's key *C. mutica* keys out as *C. tuberculata*. Adult *C. mutica* are generally much larger than *C. tuberculata* and segments 1 and 2 of the males are conspicuously hairy. Dorsal tubercles are usually absent on segments 1 and 2 of *C. mutica*, though in some females small tubercles may be present. The male second gnathopod possesses a relatively straight palmer margin with 2 forward pointing teeth, the second tooth followed by an oblique notch and a smaller third tooth distally. The female second gnathopod is similar in structure but the marginal teeth and notches are very much smaller.

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A LESSER WEEVER FISH *ECHIICHTHYS VIPERA* IN THE CLYDE ESTUARY

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The Lesser Weever (*Echiichthys vipera*) with its venomous dorsal spines is well known as a hazard to bathers and surfers in southern Britain. It is less common further north but occurs in coastal areas along the north coast of Wales, the Liverpool Bay area and up into the Solway Firth (Parker-Humphreys, 2004). They appear to like sandy estuaries and are very common in the Ribble Estuary in Lancashire (Steve Coates, Environment Agency, *pers. comm.*). They feed on a variety of small crustaceans (Vasconcelos *et al.* 2004).

The Scottish Environment Protection Agency SEPA (and its predecessor the Clyde River Purification Board) have undertaken assessment of the fish populations in the Clyde Estuary for over 20 years (see Henderson & Hamilton, 1986). During routine beam trawling on 25th May 2004 a Lesser Weever was caught between Crannog and Milton, just west of the Erskine Bridge. The juvenile fish, about 6cm long, was transported alive to the SEPA lab at East

Kilbride for closer examination in an aquarium, before being returned to the estuary the following day. It possessed the characteristic oblique mouth, top set eyes and the prominent black first dorsal fin, as well as the typical yellowish tail fin and brown-mottled flanks with a light violet sheen (Dipper, 1987).

Lesser Weevers were described as "very rare" in the Clyde Sea Area by Bagenal, (1965) although Haliday (1969) recorded juveniles around 1.5-2cm long netted in Kames Bay, Millport. Since then they have periodically turned up in Kames Bay and there have been occasional stinging incidents there and on the Ayrshire coast (Jim Atkinson, University Marine Biological Station Millport, *pers. comm.*). It seems likely that moderate numbers are present at all times but the coldness of Scottish waters means few bathers are likely to come in contact with the fish. As the fish prefer shallow sublittoral waters the vulnerable time is paddling at low water. One member of SEPA's staff remembers being stung by a weever fish, as a boy in 1971 at Glasnacardoch Beach (near Mallaig). He subsequently captured and killed the fish. This was before he became more "environmentally aware"! (Pat Duffy, SEPA, *pers. comm.*).

The occurrence of a juvenile Lesser Weever in the Clyde Estuary does appear to be unusual and suggests that a population of adults may be present nearby. However, monitoring of the estuarine fish communities between Dumbarton and Bowling (and further down the estuary at Pillar Bank) has been carried out four times a year since 1979 and no Lesser Weevers have ever been recorded. The nearest record of another Lesser Weever appears to be a specimen held by Glasgow Museums trawled between Dunoon and Innellan in 1976 (Richard Sutcliffe, Glasgow Museums, *pers. comm.*). It is possible that distributions of some estuarine fish species may be shifting in response to environmental changes - whether these be localised water quality improvements, sedimentary changes or perhaps Global warming (Smith, 2002, Hiscock *et al.*, 2004) - but it is too early to say whether the appearance of the Lesser Weever in the estuary is indicative of any trend.

The Scottish Association for Marine Science (SAMS) has carried out annual fish surveys on a number of shores in western Scotland between 2002 and 2005 (Mike Burrows, *pers. comm.* 2005). Lesser Weevers were caught in NW Scotland at Mellon Charles, Firemore, and Ganavan, near Oban at Tralee and Ganavan, and in Lochs Sween and Coalisport, and at Tayinloan on the Kintyre peninsula. In the Firth of Clyde area they were caught on the Kintyre peninsula at Skipness and Carradale and on the Ayrshire coast at Ayr and Girvan. The numbers captured were usually no more than 2-3 per survey though at Firemore and Gairloch up to 13 and 18 respectively were recovered. Overall, between 20 and 30 were